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Full Length Research Paper

Effect of applied water and discharge rate on wetted soil volume in loam or clay-loam soil from an irrigated trickle source

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Abstract

This study was designated to determine the effect of different applied water by use of different emitter discharges on the wetting patterns of a loam or clay-loam soil under trickle source. Irrigation water was applied when the soil water depletion of 30 and 50% from available water capacity of soil in 0 - 90 depth. The discharge rates of 2 and 4 L h^{-1} was selected in irrigation treatments. The parameters affected the wetted soil volume of vertical wetting front advance Z_f, lateral wetting front advance within the soil profile R_s or at the surface R_f, were researched. The Z_f and R_s varied 43 to 58 cm and 54 to 60 cm, respectively. Different emitter discharges had no significant effects on Z_f, R_s and R_f. Different water applications had significant effect on Z_f but, had no significant effects on R_s or R_f. The highest wetted soil volume was obtained as 122681.6 cm^3 irrigation at 50% depletion from the available water capacity of soil from by 4 L h^{-1} emitter discharge use. The results showed that higher application rate favors the both vertical and lateral direction of water.

Key words: Trickle, irrigation, wetting front, wetted volume.

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